

REMARKS

The non-final Office Action dated November 4, 2009 has been carefully reviewed and the following remarks are responsive thereto. Claim 9 has been amended.

No new matter has been added.

Claims 1-21 remain pending upon entry of the present amendment. Reconsideration and allowance are respectfully requested.

Claim Rejections under 35 U.S.C. §102

The Office Action rejected claims 1-3, 5, 16-18 & 20-21 under 35 U.S.C. 102(e) as being anticipated by Li (US Publication No. 2006/0182119 A1, hereafter referred as "Li"). The applicants respectfully disagree for the following reasons.

To anticipate a claim, a single reference must disclose each element of that claim.

As per claim 1:

Claim 1 of the present invention defines a method for realizing QoS guarantee in a MPLS network having a number of edge routers, the method comprises: creating an individual QoS resource list in each edge router to record a resource state corresponding to a path; each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and updating the QoS resource list.

The applicants respectfully submit that the claimed invention of independent claim 1 differs substantially from Li, and at least the following elements provided by claim 1 of the present invention are not found in Li:

1) The element "creating individual QoS resource list in each edge router to record a resource state corresponding to a path" is not found in Li.

Li at most discloses "adding the edge router ID of each passed QOS domain in the edge router list of the resource request message" (Please refer to page 3, paragraph 0041 of Li) and "storing said edge router list in the QOS edge router connected with the destination terminal of the data flows" (Please refer to page 3, paragraph 0042 of Li). Li does not disclose "creating individual **QoS resource list** in each edge router". Indeed, in Li, *only the edge router ID* of each passed QOS domain is added in the edge router list. The QoS resource list is different from the

edge router ID. The QoS resource list saves the resource information of the paths in the whole MPLS network, and includes the following field structure: egress edge router, service class, LSP resources, and available resources (Please refer to lines 7-12 and 17-18 in page 5 of the specification of the present invention). The QoS resource list is maintained in the edge router, so that the access control can be implemented on the resource requirement based on the resource states of the paths. Thus, to a person of ordinary skill in the art, it can be seen that the edge router ID in Li is not equivalent to “the QoS resource list” as recited in claim 1 of the present invention.

In other words, in claim 1, individual QoS resource list is created in each edge router. Whereas, the edge router in Li only adds edge router ID of each passed QOS domain in the edge router list.

Thus, Li does not disclose the above element defined in claim 1 of the present invention.

2) The element “each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and updating the QoS resource list” is not found in Li.

Li at most discloses “the QOS edge router, which receives the resource allocation message, determining the resource allocation path according to the stored edge router list, transmitting the resource allocation message for the data flows along the determined resource allocation path” (Please refer to page 3, paragraph 0042 of Li). But Li does not disclose “updating the **QoS resource list.**” In Li, the edge router only has a path function, that is, the edge router determines the resource allocation path and transmits the resource allocation message along the determined resource allocation path. Further, each edge router in Li checks the adjacent QOS edge router ID in the edge router list and judges whether there are enough resources (Please refer to page 3, paragraph 0047 of Li), and the edge router connected with the source terminal performs resource allocation and *removes the edge router list from said resource allocation message* (Please refer to page 3, paragraph 0049 of Li). Here, “*removes the edge router list from said resource allocation message*” is different from “updating the QoS resource list” as recited in claim 1. In claim 1, “updating the QoS resource list” may comprise “each edge router obtain[ing] the resource information of the path from the router to each of the other edge routers in the same domain, and save[ing] the resource information in the QoS resource list” (Please refer to lines 4-6 in page 6 of the specification of the present invention). However, “*removes the edge router list from said resource allocation message*” does not obtain and/or save information.

In other words, the QoS resource list of claim 1 is updated based on the resource allocation condition. In contrast, the edge router in Li only removes the edge router list from said resource allocation message.

Thus, Li does not disclose the above element defined in claim 1 of the present invention.

In addition, the edge router of claim 1 is not the equivalent to the edge router of Li. In Li, a policy server is introduced to cooperate with the edge router. Whereas, the edge router of claim 1 has a resource access function, and does not need a policy server.

Therefore, contrary to the Examiner's contention, Li does not disclose or even suggest each and every element of claim 1. So, Li cannot provide a basis for a rejection under 35 U.S.C. 102(e).

The subject matter defined in claim 1 can provide a "decision basis for controlling resource assignment later" (Please refer to lines 6-7 in page 6 of the specification of the present invention). Thus, the problem of providing QoS guarantee is solved by the technical scheme defined in claim 1.

Further, the cited art, as a whole, does not suggest or teach the above distinguishing technical features. Applicants respectfully submit that the cited art does not provide any relative teachings for one of ordinary skill in the art to acquire the technical scheme defined in claim 1 over Li with a combination of the above distinguishing technical features and further solves the technical problem at hand. The applicants respectfully submit that it is non-obvious for one of ordinary skill in the art at the time of the invention to modify Li by the existing technology in the cited art, to solve the problem solved by the claimed subject matter. Accordingly, claim 1 also conforms to the provisions of 35 U.S.C. 103.

As such, the applicants respectfully submit that claim 1 is in condition for allowance.

As per claim 2:

Claim 2 is a dependent claim of independent claim 1, and further defines the following additional technical feature: the resource states of the paths from the edge router to all the other edge routers in the same domain are recorded in said QoS resource list.

Li does not disclose "the resource states of **the paths from the edge router to all the other edge routers in the same domain** are recorded in said QoS resource list." Indeed, in Li, the condition of resource reservation is about *a path from one edge router to another edge router*

(Please refer to page 3, paragraph 0044 of Li: judging the condition of resource reservation for aggregate flows between the passed QOS edge router and adjacent QOS edge router).

Thus, Li does not disclose the above additional technical feature defined in claim 2.

In addition, as stated above, independent claim 1 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 2, which depends on claim 1, is also in conformity with the requirements of novelty and non-obviousness.

As per claim 3:

Claim 3 is a dependent claim of independent claim 1, and further defines the following additional technical feature: 1) pre-configuring LSPs based on service class to set different LSPs for different service classes; 2) said edge router obtaining resource information of the path from the edge router to each of the other edge routers in the same domain based on LSP resource state information and route information of said MPLS network, and saving the resource information in the QoS resource list.

Li does not disclose these technical features of claim 3. Firstly, with reference to page 1, paragraph 0010 of Li, *RSVP-based Integrated Service* is disclosed. However, Li does not disclose **setting of LSP**, which can realize the division of LSP to form the paths from each edge router to other edge routers in same domain. Secondly, with reference to page 2, paragraph 0029 of Li, only “*establishing resource reservation path*” is disclosed, but no “**resource information of the path from the edge router to each of the other edge routers in the same domain**” is disclosed.

Thus, Li does not disclose the above additional technical features defined in claim 3 of the present invention.

In addition, as stated above, independent claim 1 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 3, which depends on claim 1, is also in conformity with the requirements of novelty and non-obviousness.

As per claim 5:

Claim 5 is a dependent claim of independent claim 1, and further defines the following additional technical feature: said QoS resource list at least comprises information of an egress edge router, service class, LSP resources and available resources.

Li does not disclose this technical feature of claim 5. With reference to page 1, paragraph 0010 of Li, each router along the path records *state information* of each flow and provides corresponding service assurance. Li does not disclose that the “*state information*” comprises “**information of the egress edge router, service class, LSP resources and available resources**”.

Thus, Li does not disclose the above additional technical feature defined in claim 5 of the present invention.

In addition, as stated above, independent claim 1 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 5, which depends on claim 1, is also in conformity with the requirements of novelty and non-obviousness.

As per claim 16:

Claim 16 is an apparatus implementation of the method claimed in claim 1 and comprises all the elements of claim 1.

As stated above, independent claim 1 complies with the requirements of novelty and non-obviousness. For the similar reasons discussed with respect to claim 1 above, Li fails to disclose or suggest each and every element of claim 16. Therefore, claim 16 should be allowed.

As per claim 17:

As stated above, independent claim 16 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 17, which depends on claim 16, is also in conformity with the requirements of novelty and non-obviousness.

As per claim 18:

As stated above, independent claim 16 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 18, which depends on claim 16, is also in conformity with the requirements of novelty and non-obviousness.

As per claim 20:

As stated above, independent claim 16 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 20, which depends on claim 16, is also in conformity with the requirements of novelty and non-obviousness.

As per claim 21:

Claim 21 defines an MPLS network for realizing QoS guarantee, the MPLS network comprises the edge router defined in claim 16-20. So, claim 21 comprises all the elements of claims 16-20.

As stated above, claims 16-20 comply with the requirements of novelty and non-obviousness. For the similar reasons discussed with respect to claim 16-20 above, Li fails to disclose or suggest each and every element of claim 21. Therefore, claim 21 should be allowed.

Claim Rejections under 35 U.S.C. §103

The Office Action rejected claims 6-7 & 10-11 under 35 U.S.C. 103(a) as being unpatentable over Li in view of Rabie (US Publication No. 2003/0076829 A1, hereafter referred as "Rabie"). The applicants respectfully disagree for the following reasons.

As per claim 6:

Claim 6 defines a method for establishing a QoS data path in a MPLS network, the method comprises: a user terminal sending a QoS resource request to an ingress edge router; said edge router determining information of a path to an egress edge router of the QoS resource request; said ingress edge router determining whether the resource request is accessed or rejected based on comparing available resources of the requested resources corresponding to the path recorded in said QoS resource list with bandwidth resources requested in said resource request; and when the resource request is determined to be accessed, updating said QoS resource list.

Li discloses a method for implementing resource allocation in network communication. Comparing claim 6 with Li, it can be seen that there are at least the following distinguishing technical features between claim 6 and Li:

1) In claim 6 said ingress edge router **determines whether the resource request is accessed or rejected based on comparing available resources of the requested resources corresponding to the path recorded in said QoS resource list with bandwidth resources requested in said resource request.** However, Li only discloses “*judging whether there are enough resources between the QOS edge router and the adjacent QOS edge router*” (Please refer to page 3, paragraph 47 of Li). Li does not disclose how to judge whether there are enough resources in the path recorded in the QoS resource list.

Thus, Li does not disclose the above technical feature defined in claim 6 of the present invention.

2) In claim 6, when the resource request is accessed, **said QoS resource list is updated.** However, in Li, the edge router checks the adjacent QoS edge router ID in the edge router list and judges whether there are enough resources (Please refer to page 3, paragraph 0047 of Li). If so, the edge router connected with the source terminal receives said resource allocation message, performs resource allocation, and *removes the edge router list form said resource allocation message* (Please refer to page 3, paragraph 0049 of Li). “*Remov[ing] the edge router list form said resource allocation message*” is not equivalent to “**updating said QoS resource list**” in claim 6. QoS resource list comprises information of the egress edge router, service class, LSP resources and available resources, not only the edge router list. And updating said QoS resource list comprises “the bandwidth resources requested in the resource request are subtracted from the available resources of the path in the QoS resource list” (Please refer to lines 15-16 in page 7 of the specification of the present invention). However, “removes the edge router list form said resource allocation message” is not equivalent to “the bandwidth resources requested in the resource request are subtracted from the available resources of the path in the QoS resource list.” So, “updating said QoS resource list” of claim 6 is not just “removing the edge router list form said resource allocation message.”

Thus, Li does not disclose the above technical feature defined in claim 6.

That is to say, there are at least the following distinguishing technical features between the method defined in claim 6 and Li: Firstly, said ingress edge router determining whether the

resource request is accessed or rejected based on comparing available resources of the requested resources corresponding to the path recorded in said QoS resource list with bandwidth resources requested in said resource request; Secondly, when the resource request is determined to be accessed, updating said QoS resource list. So the method defined in claim 6 can provide absolute guarantee for each stream to have sufficient resources (Please refer to lines 15-17 in page 2 of the specification of the present invention) and, therefore, guarantee the QoS of the data stream entering the network (Please refer to lines 2-4 in page 3 of the specification of the present invention). Thus, the problem of providing QoS guarantee is solved by the technical scheme defined in claim 6. However, Li does not suggest or teach the above technical feature defined in claim 6.

Rabie discloses “it is determined if the connection for the service category requested can be supported by comparing the available bandwidth for the link/pool with the calculated reserved bandwidth” (Please refer to page 3, paragraph 0041 of Rabie). However, in Rabie, “the available bandwidth” is not recorded in the QoS resource list, instead, the available bandwidth is advertised to every other node (Please refer to page 3, paragraph 0039 of Rabie). And the advertised available link capacity is compared with actual link capacity (Please refer to page 3, paragraph 0037 of Rabie). So, it can be seen that “the available bandwidth” of Rabie is not equivalent to “available resources of the requested resource.”

Thus, Rabie does not disclose the above distinguishing technical feature defined in claim 6 of the present invention.

Further, the cited art, as a whole, does not suggest or teach the above distinguishing technical features. The applicants respectfully submit that the prior art does not provide any relative teachings for one of ordinary skill in the art to acquire the technical scheme defined in Claim 6 over Li and Rabie with a combination of the above distinguishing technical features and further solves the technical problem at hand.

Applicants respectfully submit that it is non-obvious for one of ordinary skill in the art at the time of the invention to modify Li and Rabie, to solve the problem at hand.

As such, applicants respectfully submit that claim 6 is in condition for allowance.

As per claim 7:

Claim 7 depends on independent claim 6, and further defines the following additional technical feature: the resource states of the paths from the edge router to all the other edge routers in the same domain are recorded in said QoS resource list.

This additional technical feature of claim 7 of the present invention is neither disclosed in Li and Rabie, nor disclosed by the cited art.

In addition, as stated above, independent claim 6 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 7, which depends on claim 6, is also allowable.

As per claim 10:

Claim 10 is a dependent claim of independent claim 6, and further defines the following additional technical feature: subtracting the bandwidth resources requested in said QoS resource request from the available resources of the corresponding requested resources in said QoS resource list.

This additional technical feature of claim 10 is neither disclosed in Li and Rabie, nor disclosed by the cited art.

In addition, as stated above, independent claim 6 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 10, which depends on claim 6, is also allowable.

As per claim 11:

Claim 11 is a dependent claim of independent claim 6, and further defines the following additional technical feature: said QoS resource list at least comprises information of the egress edge router, service class, LSP resources and available resources.

This additional technical feature of claim 11 is neither disclosed in Li and Rabie, nor disclosed by the cited art.

In addition, as stated above, independent claim 6 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 11, which depends on claim 6, is also allowable.

The Office Action rejected claims 12-15 under 35 U.S.C. 103(a) as being unpatentable over Kurose (US Publication No. 2003/0084089 A1, hereafter referred as “Kurose”) in view of Li. The applicants respectfully disagree for the following reasons.

As per claim 12:

Claim 12 defines a method for terminating QoS data transmission in a MPLS network, the method comprises: an ingress edge router receiving a resource releasing request from a user terminal; said ingress edge router releasing the resources occupied by said user terminal; and said ingress edge router modifying its QoS resource list which records a resource state corresponding to a path.

Comparing claim 12 with Kurose, it can be seen that there are at least the following distinguishing technical features between claim 12 and Kurose: **said ingress edge router modifying its QoS resource list which records a resource state corresponding to a path.**

That is to say, there are at least the following distinguishing technical features between the method defined in claim 12 and Kurose: said ingress edge router modifying its QoS resource list which records a resource state corresponding to a path. By doing so, the resource states are updated, and other data paths can use the released resources. Thus, the problem of providing QoS guarantee is solved by the technical scheme defined in claim 12. However, Kurose does not suggest or teach the above technical feature defined in claim 6.

Li discloses that “if the resources are not enough, returning a request failure message; otherwise adding R1 ID in the QER list of the resource request message and forwarding the resource request message” (Please refer to page 8, paragraph 172 in Li). However, Li does not disclose the ingress edge router “**modifying its QoS resource list**” and does not disclose that the QoS resource list “**records resource state corresponding to a path**”. Firstly, Li only adds R1 ID in the QER list of the resource request message, whereas in claim 12, modifying QoS resource list is not adding a edge router ID in the resource list, specifically, modifying QoS resource list comprises “add[ing] a corresponding amount to the available QoS resources corresponding to the egress edge router of the QoS data transmission path occupied by the user terminal in the QoS resource list” (Please refer to lines 2-4 in page 11 of the specification). Secondly, in Li, the QER list only records IDs of edge routers, whereas in claim 12, the QoS resource list records a resource state corresponding to a path. Thirdly, “modifying its QoS resource list” in claim 12 is in the

process of terminating QoS data transmission, whereas, “adding R1 ID in the QER list” is in the resource allocation process (Please refer to page 8, paragraph 170 of Li).

Thus, Li does not disclose the above distinguishing technical feature defined in claim 12 of the present invention.

Further, the cited art, as a whole, does not suggest or teach the above distinguishing technical features. The applicants respectfully submit that the cited art does not provide any relative teachings for one of ordinary skill in the art to acquire the technical scheme defined in Claim 12 over Kurose and Li with a combination of the above distinguishing technical features and further solves the technical problem at hand.

Applicants respectfully submit that it is non-obvious for one of ordinary skill in the art at the time of the invention to modify Kurose and Li by the existing technology in the cited art, to solve the problem to be solved in the claimed subject matter.

As such, applicants respectfully submit that claim 12 is in condition for allowance.

As per claim 13:

As stated above, independent claim 12 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 13, which depends on claim 12, is also allowable.

As per claim 14:

As stated above, independent claim 12 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 14, which depends on claim 12, is also allowable.

As per claim 15:

As stated above, independent claim 12 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 15, which depends on claim 12, is also allowable.

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara (US Patent No. 7,215,640 B2, hereafter referred as “Matsubara”) in view of Li. The applicants respectfully disagree for the following reasons.

As per claim 4:

Claim 4 depends on claim 1, and further defines the following additional technical features: said edge router receiving a resource request from the user terminal; said edge router searching said QoS resource list for available information of the requested resources based on an egress edge router in said resource request; said edge router determining whether the resource request is accessed or rejected based on the available information of said requested resources; when the resource request is determined to be accessed, modifying the available information of the requested resources in said QoS resource list and sending an acknowledgement message to said user terminal.

Matsubara discloses that “the first-hop node searches *the node Flow-Path Table*” (Please refer to column 6, lines 50-53 of Matsubara). However, Matsubara does not disclose “said **QoS resource list**,” and “the node Flow-Path Table” does not function as “said QoS resource list,” the QoS resource list of claim 4 comprises the resources state. Further, Matsubara disclose that “the last-hop node sends an acknowledgement (ACK) to the first-hop node that indicates its part in the process is completed to date” (Please refer to column 11, lines 30-33 in Matsubara). However, Matsubara does not disclose “**modifying the available information of the requested resources in said QoS resource list.**” Thus, the above additional technical features are not disclosed in Matsubara.

Li does not disclose the above additional technical features.

Further, the cited art, as a whole, does not suggest or teach the above distinguishing technical features. The applicants respectfully submit that the cited art does not provide any relative teachings for one of ordinary skill in the art to acquire the technical scheme defined in Claim 4 over Li and Matsubara with a combination of the above distinguishing technical features and further solves the technical problem to be solved by the claimed subject matter.

Applicants respectfully submit that it is non-obvious for one of ordinary skill in the art at the time of the invention to modify Li and Matsubara arrived at the claimed subject matter.

In addition, as stated above, independent claim 1 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 4, which depends on claim 1, is also allowable.

The Office Action rejected claims 8-9 & 19 under 35 U.S.C. 103(a) as being unpatentable over Li in view of Rabie, in further view of Matsubara. The applicants respectfully disagree for the following reasons.

As per claim 8:

Claim 8 is a dependent claim of independent claim 6, and further defines the following additional technical features: comparing available resources of the requested resources in said QoS resource list with bandwidth resources requested in said resource request; if said available resources are less than said bandwidth resources, sending a message of rejecting access to said user terminal, otherwise allowing said user terminal to access.

Matsubara discloses that “the node determines if the path has the resource needed to match that of the request” (Please refer to column 6, lines 64-67). However Matsubara does not disclose **“QoS Resource list”** and **“comparing available resources of the requested resources in said QoS resource list with bandwidth resources requested in said resource request”**, that is, Matsubara does not disclose how to determine if the path has the resource needed to match that of the request. Thus, Matsubara does not disclose the above additional technical features.

Further, the cited art, as a whole, does not suggest or teach the above distinguishing technical features. The applicants respectfully submit that the cited art does not provide any relative teachings for one of ordinary skill in the art to acquire the technical scheme defined in Claim 8 over Li and Rabie and Matsubara with a combination of the above distinguishing technical features and further solves the technical problem at hand.

Applicants respectfully submit that it is non-obvious for one of ordinary skill in the art at the time of the invention to modify Li and Rabie and Matsubara to arrive at the claimed subject matter.

In additional, as stated above, independent claim 6 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 8, which depends on claim 6, is also allowable.

As per claim 9:

As stated above, claim 8 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 9, which depends on claim 8, is also allowable.

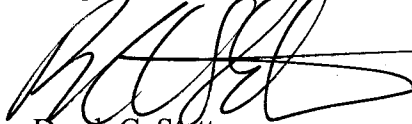
As per claim 19:

As stated above, independent claim 16 complies with the requirements of novelty and non-obviousness. Thus, the applicants respectfully submit that dependent claim 19, which depends on claim 16, is also allowable.

Conclusion

In view of the above, entry of the present Amendment and allowance of the pending claims are respectfully requested. If the Office has any questions regarding this Amendment, the Office is requested to contact the undersigned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Derek C. Stettner', is written over a horizontal line.

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